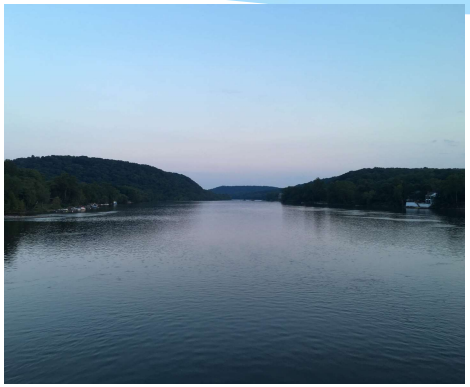
Delaware River Basin Commission

Flexible Flow Management Program: a Brief History


Amy L. Shallcross

Manager, Water Resource Operations

Friends of the Upper Delaware River

Water, Water, Everywhere Conference

October 11, 2022

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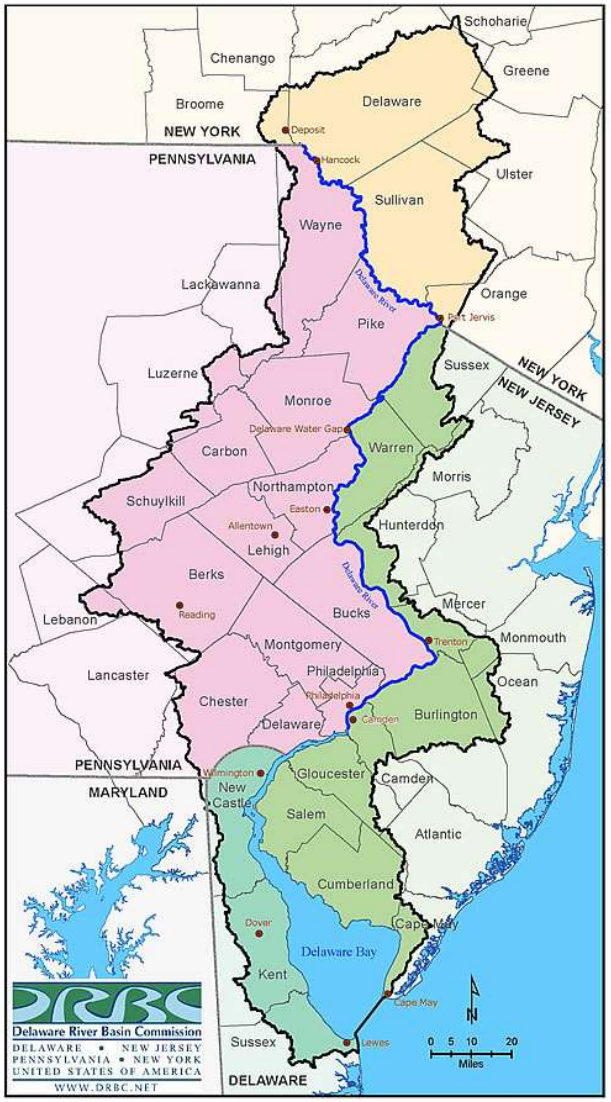

"A river is more than an amenity, it is a treasure"

-US Supreme Court Justice Oliver Wendell Holmes

- Delaware River Main stem river is **330 miles long**
- Delaware River forms an interstate boundary over its entire length
- **Drains 13,539 square miles** of watershed in 4 states.
- **13.3 million people** (approximately 5% of the U.S. population) rely on the waters of the Delaware River Basin
- Water **withdrawal** in the Basin = **6.4 billion gallons a day**
- **Significant Exports: NYC (up to 800 MGD) and NJ (up to 100 MGD)**
- Longest, un-dammed U.S. river east of the Mississippi (dams are located on tributaries, not the main stem Delaware)
- **Contributes over $21B in economic value** to the Region.

Flexible Flow Management Program: Evolution

* 1931 and 1954 Supreme Court Decree
* Delaware River Basin Commission and DRB Water Code
* NY Regulations of Conservation Releases
* Good Faith Agreement
* Conservation Release Dockets
* FFMP Performance Goals
* FFMP Implementation Performance

https://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html

Pepacton Reservoir. Photo courtesy of NYCDEP

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1954 Supreme Court Decree

* Riparian Law applied – no prior appropriation
* Montague Flow Objective (1750 cfs) – note not at Trenton
* NYC treatment of Port Jervis wastewater
* NYC Diversion limited to 800 mgd when PCN completed
* NYC to release water not needed (ERQ) limited to 70 BG
* NJ Diversion limited to 100 mgd
* Established River Master
* Inspections by NJ, PA, DE

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Delaware River Basin Commission

* Established by Federal-State Compact in 1961 to address:
  * Plan and coordinate basinwide water resource management
  * Water supply shortages – provides a venue for cooperation
  * Devastating flooding
  * Severe pollution in the main stem and major tributaries
* Authorized to change provisions of the 1954 Supreme Court Decree **ONLY WITH** the **unanimous consent** of the Decree Parties
* Required to cooperate and collaborate with States and Federal Agencies

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DRBC and the Decree Parties

DRBC:

- Delaware
- New Jersey
- Pennsylvania
- New York State
- Federal Government

Parties to the 1954 Supreme Court Decree:

- New York City

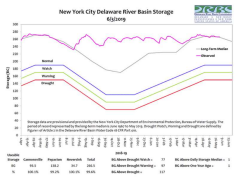
DRBC and the Decree Parties

Drought Management and the Good Faith Agreement

- Conservation Orders in 1965: Montage Flow Objective and Diversions were reduced
- DRBC directs staff to work with DPs: *develop a plan to manage drought and other issues*
- DRBC Regulated Flow Advisory Committee (RFAC, formerly FMTAC)
- Level B and other studies
- Incorporation into the **DRB Water Code**

DRBC GFA Rulemaking

  - Phased reductions in out-of-basin diversions by New York and New Jersey based on reservoir storage
  - Phased reductions in flow objectives
  - Restored flow objective at Trenton
  - Drought Management Plans – basinwide and lower basin
  - Conservation



- Experimental Fisheries Release Programs (D77-20 CP and revisions)

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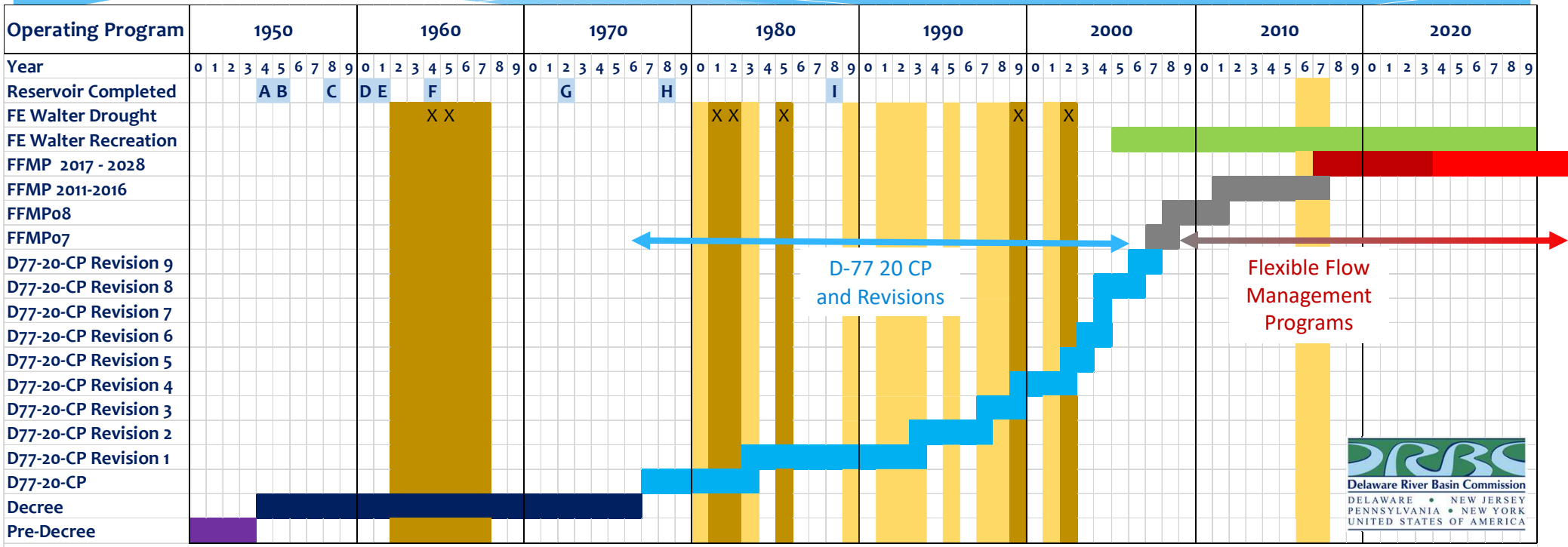
Reservoir Operating Programs

Conservation releases – flow objectives – out-of-basin diversions – banks – flood mitigation



X= Reservoir Construction Completed [A=Neversink, B=Pepacton, C=Nockamixon, D=Promtpon and Jadwin, E=FE Walter; F=Cannonsville, G=Belzville, H=Blue Marsh, I=Merrill Creek. Lake Wallenpaupack and the Mongaup System were constructed in the 1920s]; Dates are approximate.

Drought Watch or Warning | Drought Emergency | X Water Stored in FE Walter for Drought Relief

Conservation Releases

* Originally **minuscule** in the beginning – 5 cfs
* **D77-20 CP** and major revisions
* Revision 1 – default program (CP)
* Revision 4
* Revision 7

DRBC Rulemakings

* **Flexible Flow Management Programs**
* Enhanced releases for fisheries (>> D77-20 CP Rev 1)
* Joint Fisheries White Paper (NYSDEC and PAFBC)
* Thermal mitigation
* Rapid Flow Change

DRBC RFAC and SEF

Augmented and Base (drought)

Adaptive Management: "Converts [potentially] **spilled water into managed water"**
Conservation Releases based on Forecast Available Water

DRBC Advisory Committees: Regulated Flow Advisory Committee (RFAC), Subcommittee on Ecological Flows (SEF)

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FFMP Performance Goals

* Manage Droughts
* Maintain Flow Objectives
* **Provide enhanced conservation releases (habitat protection program)**
* **Maintain desirable tailwater temperatures**
* Minimize spills using the Conditional Seasonal Storage Objective (CSSO)

Performance Reports (beginning with Release Year 2014) :
https://www.nj.gov/drbc/programs/flow/FFMP_PerformanceRpts.html

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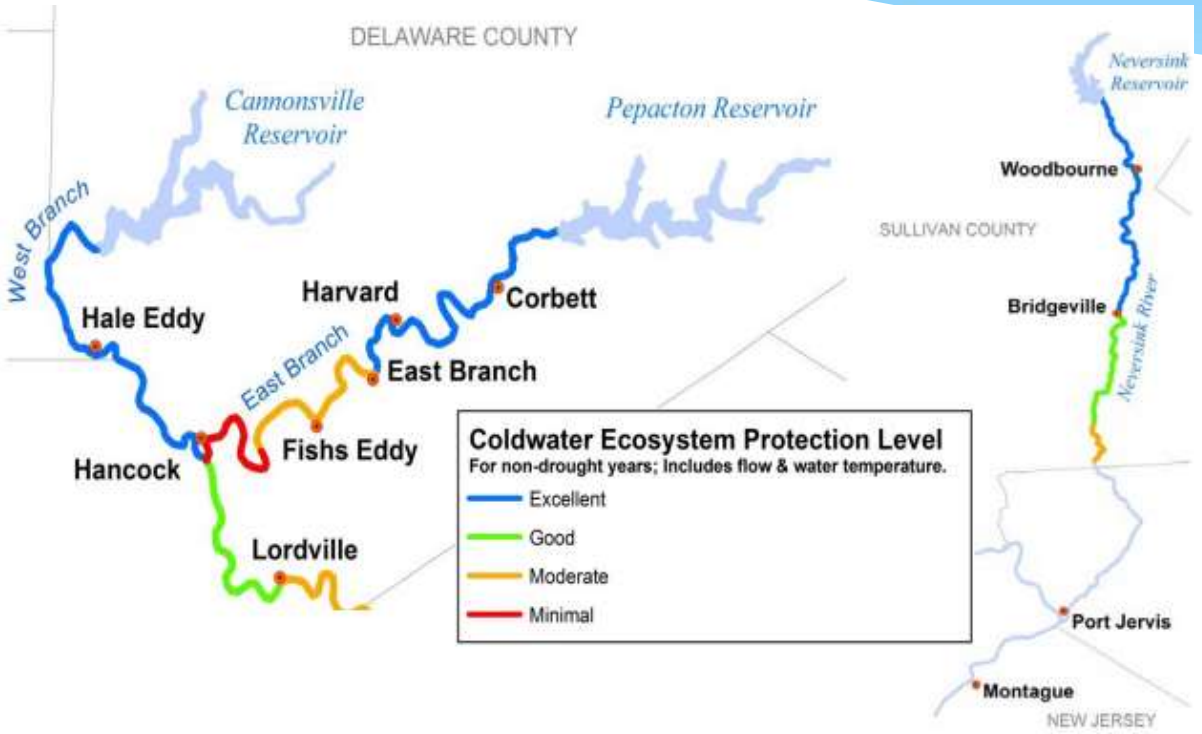
Habitat Protection

(Temperature)



Goals for Excellent Habitat:

- Summer Temperature typically less than 20°C
- Rare Exceedances greater than 24°C

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Conservation Releases

June 1, 2021 – May 31, 2022

Volume of Conservation Releases (MG)			
	FFMP 2017 Tables Based on Storage (6/1/21 - 5/31/22)	**D77-20-CP (REV1)**	**Multiple of Revision 1**
Cannonsville	128,909	20,655	6.2
Pepacton	66,254	16,505	4.0
Neversink	31,247	10,611	2.9

Values are the conservation releases required by the FFMP Tables only.
All or a portion of the release may have been used to meet the Montague Flow Objective. Additional release volume may have been required for bank use.

Data Source: NYCDEP

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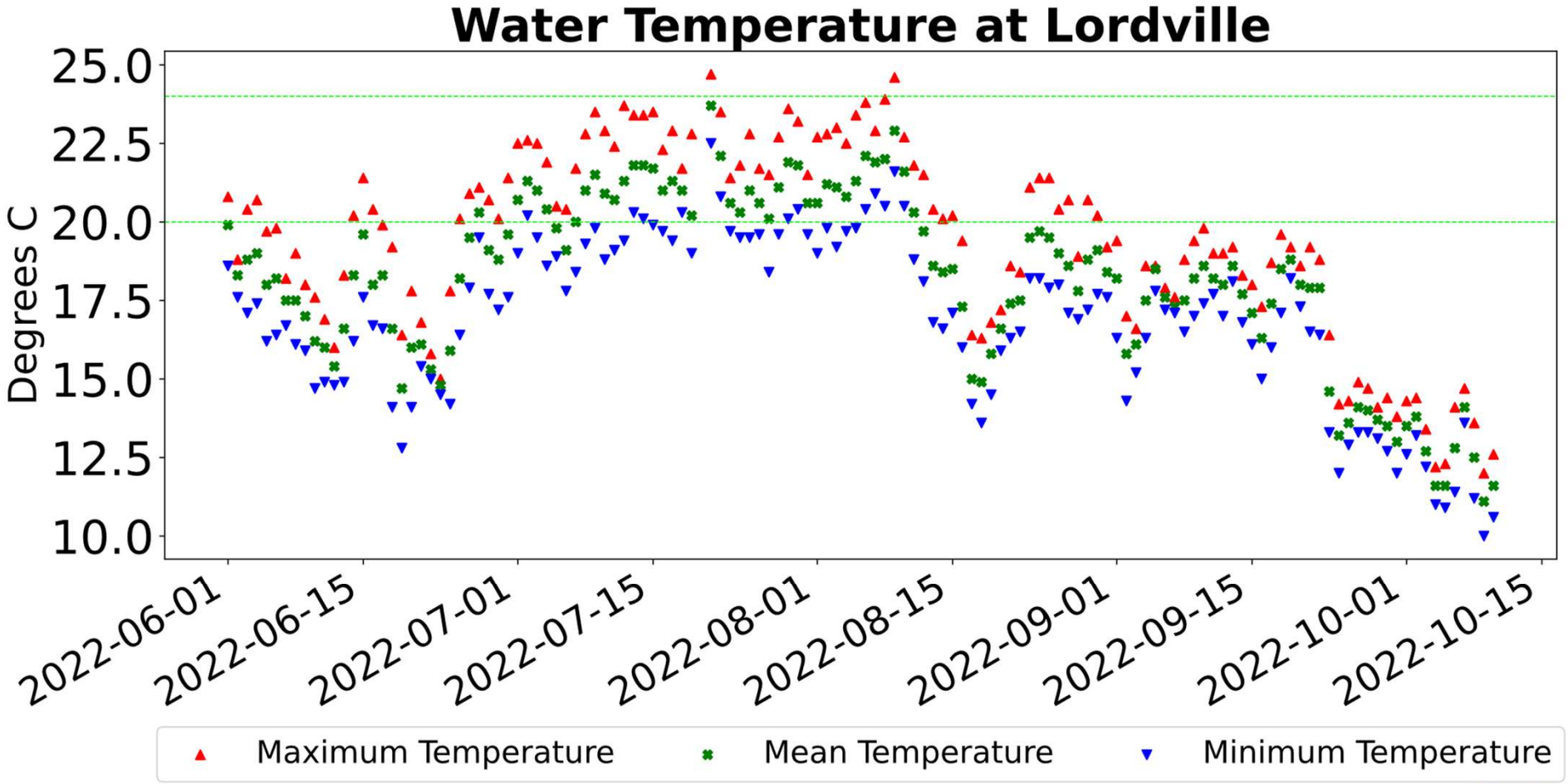
June 1, 2022 – October 10, 2022



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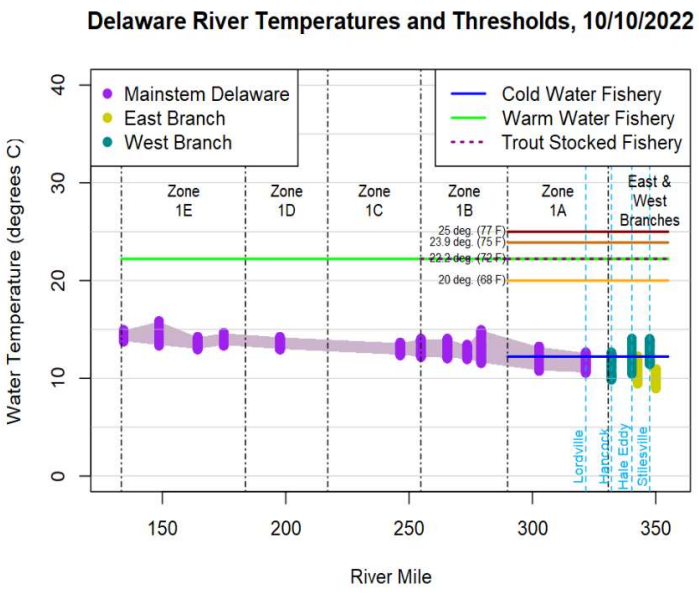
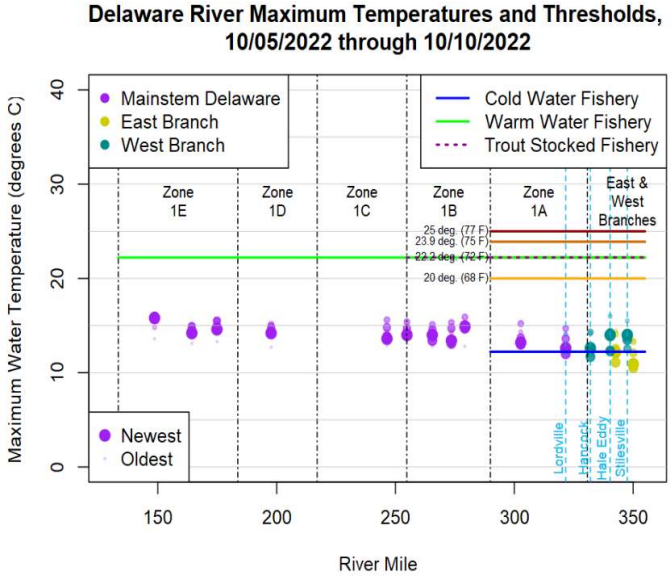
Compiled Upper Basin Temperature Information

https://www.drbc.net/Sky/uptemp.htm

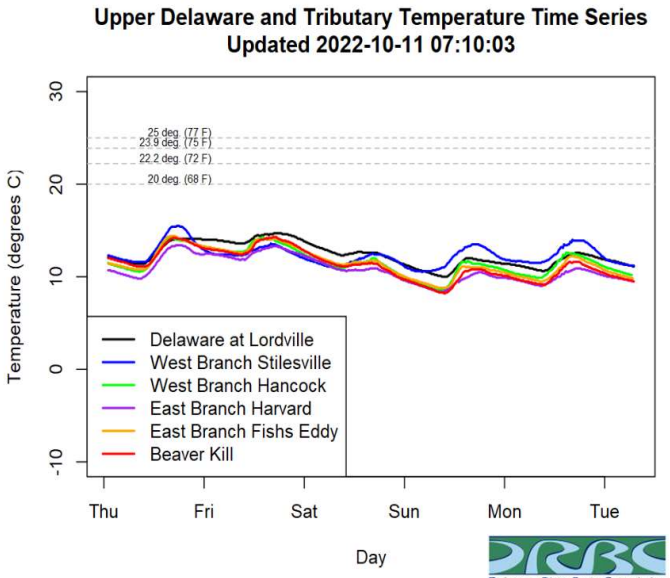
Yesterday's Range



Six-Day Range



Six Day Time-Series



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Summary

* Sixty-year development of upper basin flow management and conservation releases in the upper Delaware Basin
* Supreme Court Decrees
* DRB Water Code and Good Faith Agreement
* Experimental Fisheries Programs (D77-20-CP and revisions)
* Flexible Flow Management Program(s)
  * Adaptive Management Conservation Releases
  * Banks for thermal and rapid flow change mitigation
  * Stakeholder input through RFAC and SEF
  * Performance reports available on DRBC's RFAC Website

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